JSIMS
JIOC C4ISR Simulation and Modeling

B R I E F

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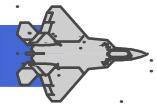
JIOC/J62

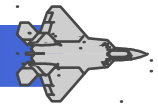
NASM INTEL DAYS Orlando, FL
29 Jun 2000

Background



- JDC 29 June 1999 Decision
- AF plan focuses on air breathing ISR Gaps from NATSIM, then additional AF ISR requirements
- “Un-sequenced” C2 systems (e.g., TIBS/TRAP)

Alliance Spirit



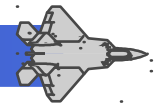
- **AF plan complies with all tenets of the JSIMS Alliance and OSD M&S goals**
  - **Complies with the JSIMS design and public interfaces**
  - **Does not adversely impact other DAs**
  - **Provides currently missing capabilities**
  - **Keep AF transition from the Joint Training Confederation on track**
- **All Alliance members will benefit from AF development**
  - **Plan addresses Alliance gaps, both directly (Airborne Sensors and ISR) and optionally (partner use or extension of IO and EW capabilities)**
- **AF plan focuses on ISR gaps from NATSIM, then additional AF ISR requirements**

ISR Schedule

- **IOC Requirements (VRM 1.0):**
  - **ISR sensors (including processing and messaging) on**
    - **U2, Rivet Joint, Predator, EP-3, Special Mission P3C**
    - **Platforms are already being developed in NASM**
- **Post – IOC Requirements (VRM 2.0, 3.0) Unfunded:**
  - **ISR sensors (including processing and messaging) on**
    - **Global Hawk**
  - **Other sensors including**
    - **Commercial Imagery (e.g., SPOT)*, Compass Call**, Cobra Gemini, Scathe View (a.k.a., Keen Sage)**
    - **Tactical Aerial Reconnaissance System (TARS), Combat Sent, Senior Scout, Cobra Judy, Cobra Ball**

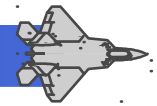
***Dependency on explicit representation of ground station.**
****Dependency on communications representation**

Implementation Strategy



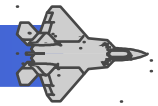
- **Re-engineering Portions of JQUAD to JSIMS HLA and use the Simulation Engine SPEEDES, RTI**
  - **Functionality re-engineered to support composability**
  - **Public interfaces will allow use by other partners**

JOISIM Re-engineering Approach



- **NASM Creates/Maintains Battle Space Entities (BSE--Platforms)**
  - **Create/update objects**
- **JOISIM Creates/Maintains Sensors**
  - **Create/update objects**
  - **Associate sensor to platform**
- **Sensor Tasking Through FOM**
- **Intel Reporting Via FOM**

Required Documents and Timeframes



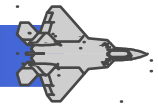
- **System RTM sequencing SPR submitted 17 Sep 99-still valid**
  - **Includes NATSIM unsequencing and Intel Ops**
- **Requirements Specification**
  - **Intel products content requirements (including enhancements) Initial: Apr 2000, Final: TBD**
  - **Intel tasking content requirements (including enhancements) Initial: Apr 2000, Final: TBD**
  - **GUI requirements by: TBD via CCWS Group**
  - **Element Functionality requirements Initial version by Apr 2000**
- **JBASS update as required for VRM 1.0 and post-IOC deliverables**
- **Requirements Trace (including Derived) completed**

Sensors (VRM 1.0)

Platforms	Sensors
EP-3	ELINT – AN/ALR-44 COMINT – COMINT 22
EP-3E	ELINT – AN/ALR-44 COMINT – COMINT22
Multiple Tactical Platforms	*OPINT - TARS
PREDITOR UAV	*OPINT - TESAR *OPINT – PRED-IR
RC-135	ELINT - AEELS ELINT – MANUAL ELINT COMINT – RJ COMINT
U-2	*OPINT – ASARS II – SPOT3 *OPINT – SENIOR GAZE *OPINT – H CAMERA *OPINT - EMTI ELINT – SENIOR RUBY COMINT – SENIOR SPEAR

*Text Reports only

Sensors (VRM 1.0)



Platforms
Sensors

P-3C	**SPECIAL MISSION**
COMBAT SENT	**ELINT**
SENIOR SCOUT	**COMINT**

Other Functionality

- **AOC, AFFOR, Wing Intel (unresolved issue)**
  - **Primarily preparation, sending, and receiving of information, e.g. intel feeds**
  - **Logical node whose operations may impact information flow (if object gets hit, flow stops)**
- **ESI**
  - **TIBS**
  - **TRAP**

JOISIM Data Approach

- **JOISIM Amplified Truth Data Base (ATDB) will include**
  - **amplifying parametric data**
  - **history tables**
  - **fixed data tables**
- **ORACLE based - uses standard SQL and PRO*C**
- **Will participate in analysis to migrate all data to a possible Common Data Repository (undefined)**
- **Will participate in analysis to use data for exercise composition**

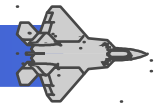
Data Consistency Questions

- **JSIMS Assumption**
  - Data from Battle Space Entity has precedence
- **Amplifying Data**
  - Signatures (RCS, IR, dimensions)
  - Description By Level of Resolution
    - Specific type/enumeration (T-80/80, F-15E/5)
    - General type/enumeration (MBT/7017, fighter/1001)
    - Class type/enumeration (armor vehicle/7000, fixed wing aircraft/1000)
  - Assigns operational parameters from min/max range (freq, PRI, bandwidth, scan rate, pulse width)

EW Functionality

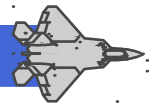
- Electronic Warfare (EW) basic adjudication functionality for A&S
  - Self Protect Jamming
  - Stand-off Radar Jamming
- SOJ of early warning/acq radar systems
- SPJ of “endgame” radar systems

EW A&S Solution



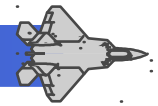
- **Implementation Strategy**
  - Create/maintain jammer equipment
  - Associate jammers to platforms
  - calculate jamming effects from SOJ jammers to target radars
  - post events for those target radars containing jamming data TBD under FOM
  - Target radars will process events and act appropriately TBD under FOM
- **Activate Jammers**
  - interactions - specifics TBD
- **Jammer Results**
  - interactions - specifics TBD
- **Need to work with other partners interested in reuse of applications**

Dependencies



- **FOM attrib required for USMTF Text Messages**
  - **RECCEXREP**
  - **TACREP**
  - **TACELINT**
  - **IIR**
  - **INTREP**
- **FOM, SIM ENGINE, API'S Needed to start design**
- **SNE**
  - **Observable features, facilities, and structures**
  - **Facility for ground radar**
  - **Weather**
- **A&S**
  - **Platforms**
- **Battlefield Encyclopedia (BE) Numbers**

Dependencies (continued)



- **LAND, MARITIME, A&S (NASM)**
  - Radar cross section
  - IR signature
  - Optical signature
  - COMINT attributes and message content (gist)
  - ELINT attributes
  - Platform element movement
  - Individual elements must be observable
  - Jamming activation/de-activation
  - Ground Radar activation/de-activation

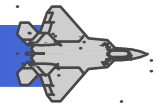
Dependencies (cont.)

- **Intel (DOMINO)**
  - **GUIs for tasking (tactical, theater, national)**
  - **Tasking (represents JIC, NMJIC, JISE)**

JSIMS V1.0 - March 2002

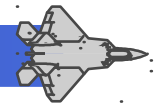
- **Incremental deliveries of increasing capability**
  - **April, July, and September 2001 (prior Integ Event 3)**
- **JOISIM (air breathing sensors currently "gapped" by other DAs)**
- **EW-Light (stand-off jamming (SOJ) against radars and self-protect jamming (SPJ) against radars)**
- **TPS-75 Radar System (radar only - must be attached to ground unit created and owned by another Federate)**
- **TIBS/TRAP Feed (will reside as a Federate to send any Federates traffic to the C4I device).**

Increment 1 - April 2001



- **JOISIM module will use JQUAD's current tasking system only**
  - **The Collection Manager (CM) module will be used to perform real-time tasking of all JOISIM sensors. JOISIM will NOT accept any outside tasking from any system or Federate of JSIMS for this increment. All output from these sensors will NOT be sent back to the simulation engine but will be sent directly to a private connection to the TIBS/TRAP feed or our private message manager for text messages.**
- **EW-Light module will accept real-time tasking of EW assets only (missions currently executing in the simulations).**
  - **EW results will be published over the RTI (or other means) for use by the affected Federates.**

Increment 1 - April 2001

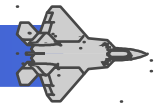


- **TPS-75 Radar System will be the same as EW Light for tasking and dissemination of aircraft track data.**
  - **Aircraft tracks will be broadcast as TIBS or TRAP surveillance tracks.**
  - **Tracks will not be sent over RTI for increment 1 (RTI mechanism not available)**
- **TIBS/TRAP Feed will be connected directly to JOISIM's fusion module.**
  - **All intelligence track data JOISIM gathers will be sent directly to the TIBS/TRAP feed without going through the RTI.**
  - **No other Federate will be allowed to send any data to the feed for transmission to any C4I device since the feed will be inaccessible from other Federates via the RTI.**

Increment 2 - July 2001

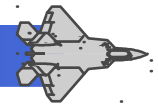
- **TIBS/TRAP C4I process will accept tracks from the RTI and send them as applicable over the feed to TIBS and/or TRAP.**
- **Contacts generated by our sensors (ELINT, RADINT, IMINT, COMINT) will be transmitted over the RTI to the rest of the Federation.**
- **All other shortcomings from Increment1 will be debugged and verified for Increment 2**
  - **Includes intelligence data transmitted or received over the RTI and items found during integration and testing of Increment 1**

Increment 3 - September 2001



- **EW Tasking for future missions (vice real-time only) will be accomplished by processing tasking as received from the RTI as some type of ATO tasking analogous to sensor tasking as define in the JSIMS FOM.**
- **Sensor tasking via the RTI for current and future missions will be accomplished via tasking as defined in the JSIMS FOM.**

Increment 3 - September 2001



- **Sensor tasking, sensor operations, EW tasking, EW operations, and other JOISIM model interfaces will be accomplished via the JSIMS Common Component Workstation (CCWS).**
  - **The primary user interface to JOISIM will be via the CCWS**
  - **JOISIM will retain all displays for model control and monitoring under the User Interface (UI) component of the JSIMS architecture design as verification, model control, and backup.**

Summary

- Plan addresses many Airborne Sensor gaps and functionality required in JSIMS
- Reuses proven components re-engineered to be consistent with JSIMS design/interfaces
- More actions remain; highly optimistic scheduling

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